

including the data from the Province of Ontario in its many peer-reviewed publications.<sup>20</sup> The data regarding preterm birth rates for Ontario and Toronto are not included in this report due to concerns about accuracy in the reporting of gestational age in the Ontario vital statistics database.

According to UNICEF every child has the right to civil registration at birth – thus being entitled to the civil rights (including recognition as a person) in the jurisdiction of birth.<sup>25</sup>

Results of a study by the Central East Health Information Partnership<sup>26</sup> show that the percentage of unregistered births (birth events not included in the official Ontario vital statistics data) in Ontario increased from less than 1% in the early 1990s to over 3% in 1998. The percentage of unregistered births is higher among mothers below 20 years of age, low birth weight births and preterm births. The rates of preterm/small for gestational age/low birth weight/intrauterine growth restricted births are likely to be underestimated in the Province of Ontario and Toronto. The introduction of birth registration fees by some municipalities (including Toronto) in 1996/1997 appears to have negatively affected the registration process. Municipalities with birth registration fees were found to have a greater prevalence of unregistered births. In the event of an early neonatal death there is no incentive for parents to register the birth of their child. This could account for a serious element of bias in the reporting of Ontario vital statistics.

#### **E. Objectives of the review:**

Evidence based practice is the “conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients”.<sup>27</sup> Based on this principle the objectives of this systematic review were to critically appraise the available evidence from systematic reviews, meta-analyses, and narrative reviews, regarding

- (a) The contributors/factors/determinants related to preterm/SGA/LBW/IUGR births and
- (b) The effectiveness or efficacy of strategies/approaches/interventions to prevent preterm/SGA/LBW/IUGR births.

The interventions that were examined in this review included currently recommended interventions undertaken in clinical practice as well as newly proposed interventions.

This review will help to guide Toronto Public Health initiatives to address the issue of preterm/LBW/SGA/IUGR births.

#### **F. Method of review:**

##### **a. Search strategy:**

A comprehensive literature search was carried out. The search strategy commenced with a search of personal files and review articles currently available within “Toronto Public Health”.

Electronic databases were searched using the draft search strategy developed within “Toronto Public Health” with the addition of relevant terminology identified in various databases. Only published studies were identified. The following databases were searched.

- MEDLINE (1966-2001)
- Embase (1992-2001)
- CINAHL (1992-2001)
- Cochrane Library- Issue 1, 2002
- PsycInfo (1992-2001)
- ERIC (1992-2001)
- Sociological Abstracts (1992-2001)
- Dissertation Abstracts (1992-2001)
- Social Sciences Citation Index (SSCI) (1992-2001)
- WHO reproductive health library (2000) No. 3
- Social Work Database (1992-2001)
- Relevant project monographs (1994-2001)

Book chapters were identified through various databases. The reference lists from recent textbooks, reviews, and reports of primary studies were examined to include additional material. The retrieval was limited to English language of publication only (due to time constraints). The number of articles scanned, selected and retrieved from each database is listed in appendix 1.

The search was updated throughout the data collection stage of the project (until February 10, 2002). This consisted of periodic re-running of the MEDLINE and current contents search strategies. Recently published issues of the key content specific journals (Pediatrics, J Pediatr, New Engl J Med, Lancet, and Am J Epidemiol) were searched manually. A librarian was consulted to design and verify the comprehensiveness of the search strategies.

**Determinants:** The following terminology was used (major subject headings were further explored using explode function in the databases):

- **Study designs** assessed were: Meta analyses, systematic reviews, literature reviews, Cochrane reviews, and narrative reviews, clinical trials, randomized controlled trials, controlled clinical trials
- **Key words** used were: infant, newborn, preterm birth, prematurity, immaturity, immature labor, premature labor, small for date, low birth weight, growth or growth diseases, IUGR, SGA, fetal growth retardation, infant sex, sex ratio, race, racial stocks, minority groups, culture, ethnic groups, ethnicity, acculturation, biculturalism, cultural conflict, ethnic neighborhoods, cultural pluralism, biraciality, maternal age, adolescent pregnancy, paternal age, multiple pregnancy, unwanted pregnancy, body constitution, maternal height, marital status, paternal height, paternal weight, maternal birth weight, maternal nutrition, parity, past history, prior history of low birth weight, general morbidity, episodic illness, prior history of spontaneous abortion, prior still birth, neonatal death, prior history of prematurity, prenatal exposure, neonatal diseases, family, life style, smoking, passive smoking, tobacco, tobacco related disorders, alcohol, drinking behavior, stress, anxiety, drug abuse, substance abuse, caffeine, marijuana, cannabis, hashish, crack cocaine,

narcotics, illicit drugs, heroin, cocaine, methadone, substance related disorders, over the counter medicine, herbal remedies, complementary medicinal use, medicinal plants, non-prescription drugs, plant extracts, street drugs, designer drugs, infection, inflammatory responses, intrauterine infection, urinary tract infection, psychological factors, poverty, socioeconomic status, caloric expenditure, exertion, activity, strenuous work, physical work, work scheduling, exercise, abuse, violence, social support, antenatal care, prenatal care, preconception care, malformations, genetic disorders, workplace hazards, environmental pollution, tobacco smoke pollution, health education, environmental hazards, toxins, noise, body constitution, body height, weight, weight gain, body weight, caloric intake, vitamin, multivitamin, education, anemia, nutrient deficiency, prepregnancy weight.

**Interventions:** The following terminology was used.

- **Population:** community wide, population, population base, adolescents, teens, teenagers, elderly, low income, low socioeconomic status, poverty, high risk, at risk, low income neighborhood, at risk neighborhood
- **Interventions:** efficacy, effectiveness, impact, evaluation for each intervention
- **Study designs:** narrative review, meta-analysis, systematic review, Cochrane review, randomized controlled trial, controlled clinical trial, and interventional study, control group
- **Outcomes:** low birth weight, preterm birth, prematurity, underweight baby, IUGR, SGA

**b. Inclusion criteria:**

The purpose of this review was to summarize the recent evidence available from systematic reviews, narrative reviews and meta-analyses on each determinant and strategies of prevention (appendix 2). When not possible to identify a review an attempt was made to describe the data from available primary studies.

Explicit inclusion criteria with a view to answer the clinical research question were used for selecting reviews. A review was considered only if it satisfied the criteria of

- Study Design
- Population
- Intervention
- Determinants
- Comparisons
- Outcomes

The selection criteria were categorized to allow for the elimination of reviews that did not provide information relevant to this review or information that was obtained from already included reviews. A list of excluded reviews is provided in appendix 3.

**c. The selection criteria:**

After identifying the existence of reviews of interest, the following phases

marked the selection procedure.

1. Both authors (PS, AO) individually assessed the titles, abstracts, and key words for each citation.
2. A review was retrieved as full publication if its title, abstract or key words suggested that the review was likely to have information regarding the research question.
3. Any difference of opinion particularly regarding the content made it mandatory to retrieve the review for clarification.
4. Assessment of eligibility of the review article was performed using a form by one author (PS) and each article was assessed for methodological rigor by both (PS and AO) authors.
5. All differences in the opinions were resolved by consensus.

**d. Data abstraction:**

This followed a stepwise procedure.

1. One reviewer (PS) abstracted and documented the content of each included review.
2. This included:
  - a. Description of each review
  - b. Year of publication
  - c. Type of review - Cochrane review, meta-analysis, narrative review etc.
  - d. Details on design of review
  - e. Search strategies
  - f. Demographic characteristics of the population
  - g. Primary outcomes
  - h. Secondary outcomes
  - i. Side effects, if applicable

Data abstraction from systematic reviews, literature reviews, narrative reviews and included primary studies was performed.

**e. Assessment of the methodological quality of reports:**

The quality of each systematic review/meta-analysis related to determinants and interventions was assessed according to the guidance from the QUOROM statement (appendices 2 and 4).<sup>28</sup> This method includes detailed assessment of abstract, methodology of literature review, results, discussion and comprehensiveness of the review. The reviews for which data were abstracted regarding epidemiological association or effectiveness of interventions were also assessed for selection bias, quality assessment of the studies and data synthesis (appendix 2). When a review was not identified for a particular determinant or intervention, selected primary studies were described. The authors do not claim this to be comprehensive. The primary studies were also assessed on the basis of sample selection, confounder assessment, data collection methods, attrition rate and analysis. If for a determinant the review did not address the issue of criteria of causation a primary study describing that association was discussed after the description of the review. Occasionally the authors identified studies that examined the impact of a certain determinant on a

subgroup; the results from such studies are reported for interest.

As predicted the authors found multiple reviews on certain subjects published at different time points that had some data abstracted from the same randomized controlled trials. This was identified and reported in the text. These results are summarized in terms of ranges of the point estimates, when possible, with clear documentation in the text.

### **G. Format of the report:**

The causative factors or the determinants for preterm/SGA/LBW/IUGR births are interrelated. It is difficult sometimes to separate out the impact of a determinant/intervention on the outcome of interest. Each factor was reviewed individually and an attempt was made to assess its significance to individual outcomes.

Each determinant is discussed with the basic principles for causation (biological plausibility, specificity, temporal relationship, consistency, strength, dose response and human experimentation). An attempt was made for each determinant first to delineate biological plausibility, followed by the strength of the epidemiological association and the available evidence for the effectiveness of interventions to improve the outcomes from the reviews on the subject. When an additional study not included in the review or published after the latest review or of interest was found a separate description was provided. If no review was identified for a determinant, a review of major individual studies in the area was performed. For the purpose of simplicity if the determinant is modifiable and, attempts to circumvent the determinant have been described in the literature, the evaluation of these strategies was performed at the same time.

The strength of the evidence for each determinant was assessed. Determinants with proven association (information from the epidemiological studies satisfying most of the causality criteria), possible association (information from the epidemiological studies satisfying some of the causality criteria but further research is needed), and no association (information from the epidemiological studies not indicative of causal association) were identified. Potential determinants for which no information was available were also identified.

The strength of the evidence was assessed for various interventions/strategies to prevent preterm/LBW/SGA/IUGR births. Interventions/strategies were identified as having strong evidence of effectiveness (cumulative evidence from well designed meta-analyses or systematic reviews indicative of effectiveness), probable evidence of effectiveness (some evidence from systematic reviews or randomized controlled studies or clinical studies indicative of effectiveness), evidence that they may be effective (evidence from clinical and/or epidemiological studies of the causality for the determinant, however intervention studies are non-existent or poorly designed) or evidence that they were not effective (cumulative evidence from well designed meta-analyses or systematic reviews indicative of ineffectiveness). Interventions/strategies were identified for which there was a lack of/inadequate information.